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A finite-volume model of the differentially heated rotating annulus with implicit sub-gridscale turbulence parameterization

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For over 50 years the differentially heated rotating annulus has been used as a model for the study of atmospheric dynamics in mid-latitudes. It is particularly suited for studying the development of large-scale waves through baroclinic instability.

We have developed a Boussinesq-equations numerical model in cylindrical coordinates for simulating flow in the annulus. For the discretization we use an energy and angular momentum conserving finite-volume scheme with an implicit sub-gridscale turbulence parameterization. The poster will present a description of the model as well as results of simulations with model parameters taken from the laboratory experiment at the Brandenburg University of Technology Cottbus.